

CLAIMS

1. A high-frequency heating apparatus comprising:
- a heating compartment in which a heating target is heated;
- 5 a high-frequency wave generator that generates a high-frequency wave;
- a waveguide through which the high-frequency wave generated by the high-frequency wave generator is guided to an opening formed in the heating compartment;
- a freely rotatable antenna that feeds the high-frequency wave inside the waveguide into the heating compartment through the opening and that has a receiver portion and a
- 10 radiator portion;
- a motor that rotates the antenna; and
- a stage that is provided above and close to the antenna so as to partition an interior of the heating compartment and that is made of a dielectric material,
- wherein
- 15 a rotary member is placed on the stage,
- either magnets are provided on both the rotary member and the antenna, or a magnet is provided on one of the rotary member and the antenna and a magnetic material is provided on the other, and
- a magnetic coupling between the antenna and the rotary member is exploited to rotate
- 20 the rotary member as the antenna is rotated.

2. The high-frequency heating apparatus of claim 1,
- wherein the rotary member is a rotary stage including:
- a support member having a plurality of rollers and magnets; and

a table that is supported on the support member and on which the heating target is placed.

3. The high-frequency heating apparatus of claim 2,
5 wherein the table is supported on the plurality of rollers by being kept in contact therewith so that, as the rollers rotate, the table rotates.

4. The high-frequency heating apparatus of claim 2 or 3,
wherein the support member is made of metal, and has at least either an opening or a
10 cut through which to pass the high-frequency wave radiated from the antenna.

5. The high-frequency heating apparatus of claim 1,
wherein the rotary member is a stirring member provided in a container placed on the
stage.

15

6. The high-frequency heating apparatus of claim 5,
wherein the stirring member includes:
a disk-shaped base;
a stirring wheel that is formed on the base; and
20 two or more rollers pivoted in a peripheral portion of the base.

7. The high-frequency heating apparatus of claim 1,
wherein a restricting member is provided on at least one of the antenna and the stage
in order to restrict movement of the antenna in an axial direction.

8. The high-frequency heating apparatus of claim 7,

wherein the antenna is composed of a cylindrical receiver portion and a substantially disk-shaped radiator portion fitted at a top end of the receiver portion coaxially therewith, and
5 the restricting member is projections formed on a top surface of the radiator portion of the antenna at equal angular intervals in a circumferential direction.

9. The high-frequency heating apparatus of claim 7,

wherein the antenna is composed of a cylindrical receiver portion and a substantially
10 disk-shaped radiator portion fitted at a top end of the receiver portion coaxially therewith, and the restricting member is rollers fitted on the radiator portion of the antenna at equal angular intervals in a circumferential direction.

10. The high-frequency heating apparatus of claim 1,

15 wherein

a first magnet is provided on the antenna, with a side of the first magnet facing the stage covered with a nonmagnetic member and a side of the first magnet facing a floor of the heating compartment covered with a magnetic member, and

a second magnet or a magnetic material is provided on the rotary member in a position
20 corresponding to the first magnet.

11. The high-frequency heating apparatus of claim 10,

wherein the antenna is formed of a nonmagnetic member, and the first magnet is provided on a bottom surface of the antenna, with a surface of the first magnet covered with a

magnetic member.

12. The high-frequency heating apparatus of claim 10,
wherein the antenna is formed of a magnetic member, and the first magnet is provided
5 on a top surface of the antenna, with a surface of the first magnet covered with a nonmagnetic
member.

13. The high-frequency heating apparatus of claim 1, further comprising:
a lower heater that is provided close to a periphery of the antenna; and
10 a controller for controlling operation of the motor and the lower heater,
wherein, when the lower heater is heated, the antenna is rotated.

14. The high-frequency heating apparatus of claim 13,
wherein, when the lower heater stops being heated, the antenna is rotated under a
15 predetermined condition.

15. The high-frequency heating apparatus of claim 14,
wherein the predetermined condition is after the lower heater stops being heated until
a timer provided for counting a time elapsed thereafter counts a predetermined length of time.

20 16. The high-frequency heating apparatus of claim 14,
wherein the predetermined condition is after the lower heater stops being heated until
a temperature sensor for sensing temperature in the heating compartment falls to a
predetermined temperature.

17. The high-frequency heating apparatus of one of claims 13 to 16,
wherein a detector for detecting whether a door of the heating compartment is open or
closed is provided so that, when the door is detected to be open after the lower heater stops
5 being heated, rotation of the antenna is stopped.

18. The high-frequency heating apparatus of one of claims 13 to 17,
wherein, when the rotary member is not used, even if the door is open after the lower
heater stops being heated, rotation of the antenna is not stopped.